REMARKS

Applicant notes that the Information Disclosure Statements filed on November 28, 200 and February 13, 2001 are not acknowledged. Applicant respectfully requests that the Examiner provide acknowledgment of these Information Disclosure Statements in the next Official Action.

Claims 1-5 are pending. Claims 1-5 stand rejected.

Rejections Under 35 U.S.C. § 112

At page 2, paragraph 4, the Office Action sets forth, "Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph...." Specifically, the Examiner contends "'a polarity angle' ... was not described in the original specification." Applicants respectfully disagree with this contention. A polarity angle for the permanent magnet of a motor is an inherent feature of a electric motor. Support for this may be found in applicant's specification as originally filed at page 2, lines 10-13, for example. Therefore, applicant respectfully requests that the rejection of claims 1-5 under 35 U.S.C. 112, first paragraph be withdrawn.

Rejections Under 35 U.S.C. § 103

At page 3, paragraph 7, the Office Action sets forth, "Claims 1-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,490,635 to Harrison et al. in view of U.S. Patent No. 4,578,606 to Welterlin." Applicant respectfully submits that this rejection is overcome by the amendment to the claims for the reasons set forth below.

Applicant's invention, as recited in claim 1, includes features which are neither disclosed nor suggested by Harrison et al. or Welterlin, namely:

> ... a rotor with a permanent magnet having P ... polarities, the permanent magnet polarities having a polarity angle of 360/P degrees ...
>
> ... any one of the coils has isosceles sides interlinking with a

> magnetic field generated by the polarities extension lines of the isosceles sides extending along centers of winding-bundles of the coil, crossing each other at a shaft center and having a vertex angle of 360/P degrees, the vertex angle being equal to the polarity angle of 360/P degrees based on the permanent magnet. (Emphasis added)

These features are described and fully supported in Applicant's specification, for example, at page 7, lines 18-20, page 8, lines 2-8 and Figs. 1A-1C.

According to claim 1, the rotor has a permanent magnet, the permanent magnet having P polarities and a polarity angle of 360/P degrees, and the coil has isosceles sides that interlink with a magnetic field generated by the polarities, extension lines of the isosceles sides extending along the center of the winding bundles of the coil. In addition, the polarities extension lines cross each other at the center of the motor shaft and have a vertex angle of 360/P degrees, with the vertex angle being equal to the polarity angle of 360/P degrees based on the permanent magnet.

Harrison et al. is relied upon as teaching a brushless motor having a rotor having P polarities and a polarity angle, and a stator having a plurality of coils. The Office Action readily admits, however, that Harrison et al. fails to disclose i) a vertex angle of 360/P degrees, ii) the vertex angle being equal to the polarity angle, iii) that the angle formed by the extension lines of the isosceles sides is the same as the polarity angle, or that the extension lines cross each other at the center of the motor shaft.

Welterlin is relied upon as disclosing a brushless motor where "any one of the coils has isosceles sides interlinking with magnetic field generated by the polarities extension lines of the isosceles sides extending through the centers of wiring-bundles of the coil, crossing each other at a shaft center having a vertex angle of 360/P degrees, the vertex being equal to the polarity angle."

First, applicant respectfully disagrees with this content, especially as it relates to the extension lines extending through the centers of the wiring bundles of the

coils in Welterlin. As clearly illustrated in the Office Action at page 4 (a copy of Fig. 2 of Welterlin), the extension lines do not extend along the centers of the coils, but rather are at an angle relative to the center line of the coils. Attached hereto as Exhibit A is an illustration of extension lines that extend through the center line of the Welterlin coils of Fig.2. As is clearly shown in Exhibit A, if lines are drawn through the centerline of the coil they do not intersect at the shaft center.

Furthermore, Welterlin does not disclose or suggest that the vertex angle is equal to the polarity angle of 360/P degrees based on the permanent magnet.

In contrast, Applicant's invention, as recited in claim 1, specifies that i) the permanent magnet of the rotor has P polarities and a polarity angle of 360/P degrees, ii) the extension lines of the isosceles sides extend through centers of the winding bundle and cross each other at the shaft center, and iii) the vertex angle formed by the extension lines is equal to the polarity angle of 360/P degrees based on the permanent magnet.

It is because Applicant has included the features of i) a rotor with a permanent magnet having P polarities, the permanent magnet polarities having a polarity angle of 360/P, ii) coils having isosceles sides with polarity extension lines extending along centers of the winding bundles and crossing each other at the shaft center with a vertex angle of 360/P degrees, and iii) the vertex angle being equal to the polarity angle of 360/P degrees based on the permanent magnet, that Applicant is able to reduce the number of coils as well as increase the motor constant. Neither Harrison et al. nor Welterlin achieve this advantage because Harrison et al. and Welterlin do not have i) a rotor with a permanent magnet having P polarities, the permanent magnet polarities having a polarity angle of 360/P, ii) coils having isosceles sides with polarity extension lines extending along centers of the winding bundles and crossing each other at the shaft center with a vertex angle of 360/P degrees, and iii) the vertex angle being equal to the polarity angle of 360/P degrees based on the permanent magnet.

For the reasons set forth above, claim 1 is neither disclosed nor suggested by Harrison et al. and Welterlin alone or in combination, thus, claim 1 is not subject to rejection under 35 U.S.C. § 103 as being unpatentable over Harrison et al. in view of

Welterlin. Reconsideration and allowance of claim 1 is respectfully requested.

Claims 2-5 ultimately depend on claim 1 and, thus, are likewise not subject to rejection for at least the reason set fort with respect to claim 1. Reconsideration and allowance of claims 2-5 is respectfully requested.

In view of the amendments and remarks set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully Submitted,

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Enclosures: Exhibit A
Version With Markings To Show Changes Made

Dated: August 26, 2002

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The Assistant Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. 18-0350 of any fees associated with this communication. Daniel N. Calder	I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on: Daniel N. Calder August 26, 2002

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Three Times Amended) A brushless motor comprising:

a rotor with a permanent magnet having P (P is an integer not less than two) polarities [and], the permanent magnet polarities having a polarity angle of 360/P degrees; and

a stator facing said rotor and having a plurality of coils,

wherein any one of the coils has isosceles sides interlinking with a magnetic field generated by the polarities, extension lines of the isosceles sides extending along centers of winding-bundles of the coil, crossing each other at a shaft center and having a vertex angle of 360/P degree, the vertex angle being equal to the polarity angle of 360/P degrees based on the permanent magnet.

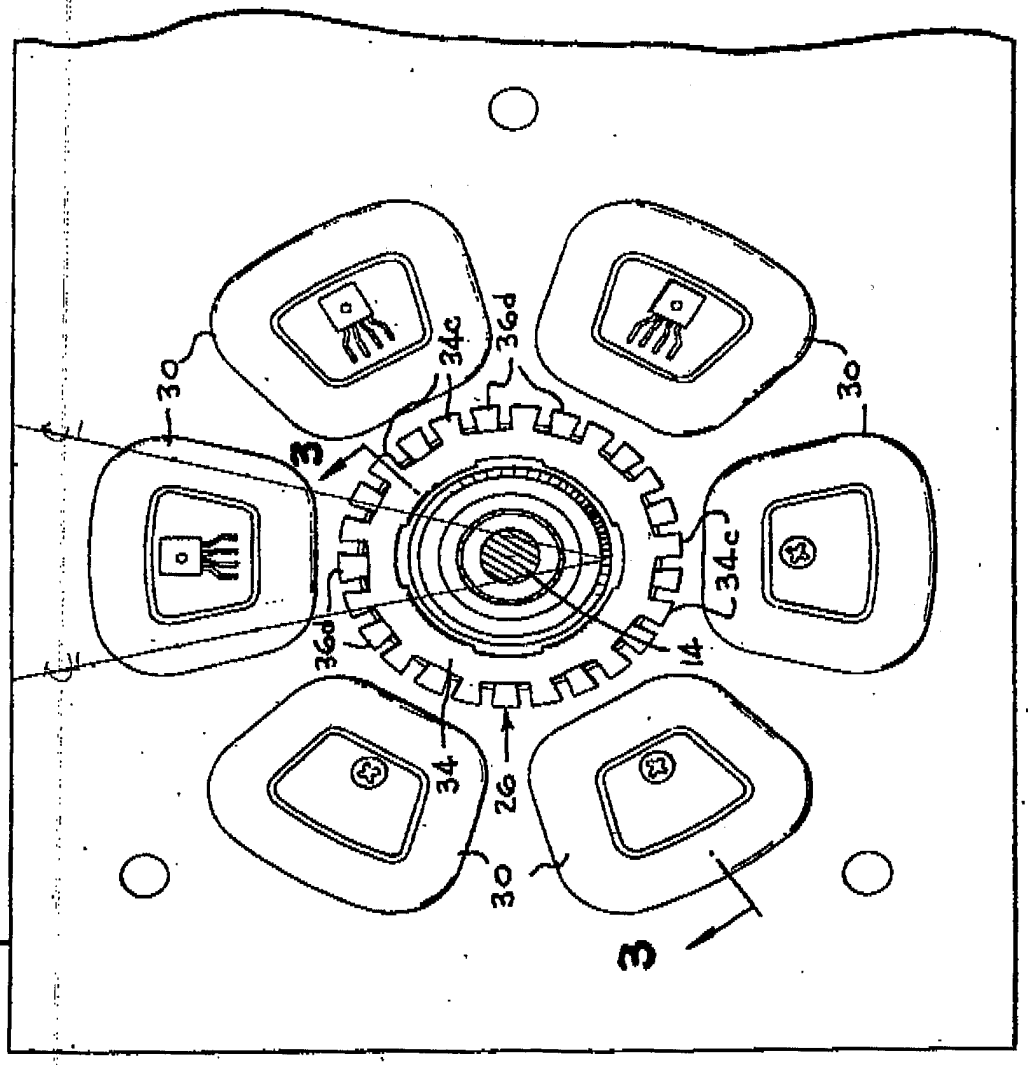

FIG-2

EXHIBIT "A"